

09/177,083

8/6/04

-20-

Peter Michaelson, Jr.

(732) 664-1

3 com - 28

What is claimed is:

1. In a receiver that receives a modulated signal having  
2 multiple levels and having an equalizer with plural  
3 equalization settings for compensating for distortion in  
4 the received signal, a method of selecting one of the  
5 plural equalization settings that provides an optimum  
6 compensation for the distortion, comprising:

7 (A) for each one of the equalizer settings:  
8 setting the equalizer to the one setting;  
9 defining valid regions encompassing each of the  
10 multiple levels of said modulated signal and invalid  
11 regions not encompassing the multiple levels;

12 computing a first metric comprising-a count of  
13 samples within said invalid regions;

14 computing a second metric comprising  
15 differences less than a predetermined threshold between  
16 pairs of samples falling within the same valid region;

17 combining the first and second metrics to  
18 produced a combined metric for said one setting;

19 (B) choosing the equalizer setting corresponding to  
20 the best combined metric.

1 2. The method of Claim 1 wherein said invalid regions  
2 lie generally between the valid regions.

1 3. The method of Claim 1 wherein each valid region  
2 includes a range of amplitudes within a predetermined  
3 fraction of the amplitudes of the corresponding multiple  
4 level.

1       4. The method of Claim 1 wherein each invalid region  
2       includes a range of amplitudes deviating by more than a  
3       predetermined fraction of a peak amplitude from the  
4       corresponding multiple level.

1       5. The method of Claim 3 wherein the predetermined  
2       threshold corresponds to a fraction less than the  
3       predetermined fraction.

1       6. The method of Claim 5 wherein the predetermined  
2       fraction corresponds to 10% and the predetermined  
3       threshold corresponds to 5%.

1       7. The method of Claim 1 wherein each of the pairs of  
2       samples falling within the valid region comprise two  
3       samples occurring successively.

1       8. The method of Claim 7 wherein a sample intervening  
2       chronologically between the two successive samples but  
3       not falling within the same valid region is ignored for  
4       purposes of determining successive samples.

1       9. The method of Claim 1 wherein the first metric is a  
2       measure of the deviation of samples from valid signal  
3       levels of the multistate signal and the second metric is  
4       a measure of the consistency of samples about each valid  
5       signal level.

1       10. The method of Claim 1 wherein the combined metric is  
2       a difference between said first and second metrics.

1 11. The method of Claim 10 wherein the best combined  
2 metric is the least positive or most negative metric.

1 12. The method of Claim 1 wherein the combined metric is  
2 a ratio between said first and second metrics.

1 13. The method of Claim 1 wherein each equalizer setting  
2 corresponds to a different transfer function of the  
3 equalizer, *as to off a plan of the function*

1 14. The method of Claim 1 wherein each transfer function  
2 corresponds to a unique set of poles and zeroes  
3 corresponding to a particular reactance. *in the function*

1 15. The method of Claim 1 wherein the step of computing  
2 the second metric is carried out for sample pairs in each  
3 of the valid regions, the number of differences not  
4 exceeding the threshold being summed across all valid  
5 regions.

1 16. A receiver that receives a modulated signal having  
2 multiple levels, said receiver comprising:

3 an equalizer with plural equalization settings for  
4 compensating for distortion in the received signal; and  
5 an adapter for selecting one of the plural  
6 equalization settings that provides an optimum  
7 compensation for the distortion at the output of the  
8 equalizer, said adapter comprising:

9 means for setting the equalizer to the one  
10 setting;

11                   means for defining valid regions encompassing  
12    each of the multiple levels of said modulated signal and  
13    invalid regions not encompassing the multiple levels;

14                   means for computing a first metric comprising a  
15    count of samples within said invalid regions;

16                   means for computing a second metric comprising  
17    differences less than a predetermined threshold between  
18    pairs of samples falling within the same valid region;

19                   means for combining the first and second  
20    metrics to produce a combined metric for said one  
21    setting and choosing the equalizer setting corresponding  
22    to the best combined metric.

1    17. The receiver of Claim 16 wherein said invalid  
2    regions lie generally between the valid regions.

1    18. The receiver of Claim 16 wherein each valid region  
2    includes a range of amplitudes within a predetermined  
3    fraction of the amplitudes of the corresponding multiple  
4    level.

1    19. The receiver of Claim 16 wherein each invalid region  
2    includes a range of amplitudes deviating by more than a  
3    predetermined fraction of a peak amplitude from the  
4    corresponding multiple level.

1    20. The receiver of Claim 18 wherein the predetermined  
2    threshold corresponds to a fraction less than the  
3    predetermined fraction.

1       21. The receiver of Claim 20 wherein the predetermined  
2       fraction corresponds to 10% and the predetermined  
3       threshold corresponds to 5%.

1       22. The receiver of Claim 16 wherein each of the pairs  
2       of samples falling within the valid region comprise two  
3       samples occurring successively.

1       23. The receiver of Claim 22 wherein a sample  
2       intervening chronologically between the two successive  
3       samples but not falling within the same valid region is  
4       ignored for purposes of determining successive samples.

1       24. The receiver of Claim 16 wherein the first metric is  
2       a measure of the deviation of samples from valid signal  
3       levels of the multistate signal and the second metric is  
4       a measure of the consistency of samples about each valid  
5       signal level.

1       25. The receiver of Claim 16 wherein the combined metric  
2       is a difference between said first and second metrics.

1       26. The receiver of Claim 25 wherein the best combined  
2       metric is the least positive or most negative metric.

1       27. The receiver of Claim 16 wherein the combined metric  
2       is a ratio between said first and second metrics.

1       28. The receiver of Claim 16 wherein each equalizer  
2       setting corresponds to a different transfer function of  
3       the equalizer.

1       29. The receiver of Claim 28 wherein each transfer  
2       function corresponds to a unique set of poles and zeroes  
3       corresponding to a particular reactance.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100